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THESIS

**APPLYING THE ART OF SYSTEMS AND
ORGANIZATIONAL ARCHITECTING IN ORDER TO
IMPLEMENT OPERATIONAL DESIGN INTO MARINE
CORPS PLANNING DOCTRINE**

by

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September 2011

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ARCHITECTING IN ORDER TO IMPLEMENT OPERATIONAL DESIGN INTO
MARINE CORPS PLANNING DOCTRINE**

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requirements for the degree of

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ABSTRACT

In 2010, the USMC changed its Marine Corps Planning Process (MCPP) to include operational design in response to direction from the Commander of United States Joint Forces Command (USJFCOM). This updated process however has proven to be misunderstood and fundamentally no different from the previous edition based upon the classical decision making model. This thesis therefore presents an alternative planning process for the United States Marine Corps. This thesis uses the foundations of systems architecting to redefine operational design as operational architecting and presents a detailed operational architecting process that translates strategic guidance into an operational design. This operational design then becomes the starting point for the traditional military planning process. The alternative planning process describes operational architecting as a distinct activity from operational planning but provides for a seamless transition between both activities and for multiple iterations if needed. The thesis recommends this process as a baseline for further refinement and experimentation as the USMC further develops its planning theory and doctrine.

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LIST OF ACRONYMS AND ABBREVIATIONS

COA	Course of Action
COG	Center of Gravity
FM	Field Manual
IPR	In Progress Review
JOPP	Joint Operational Planning Process
JP	Joint Publication
MAGTF	Marine Air Ground Task Force
MEF	Marine Expeditionary Forces
MCDP	Marine Corps Doctrinal Publications
MCIP	Marine Corps Interim Publications
MCPP	Marine Corps Planning Process
MCWP	Marine Corps Warfighting Publications
MDMP	Military Decision Making Process
OEF	Operation Enduring Freedom
OIF	Operational Iraqi Freedom
OPORDS	Operational Orders
RSE	Rapid Systems Engineering
TTPs	Tactics, Techniques and Procedures
U.S.	United States
USJFCOM	United State Joint Forces Command
USMC	United States Marine Corps
WARNORD	Warning Order

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I. INTRODUCTION

A. BACKGROUND

The United States Marine Corps foundational publication, Marine Corps Doctrinal Publication 1 *Warfighting* (MCDP 1, 1997) introduces every Marine to the fundamentals of how Marines think about and fight war. Within the description of how Marines think on war, this doctrine introduces the three levels of war: strategic, operational and tactical. Today, every Marine accepts the levels of war without disagreement or question, as if the earliest military theorists developed all three jointly. In reality, while the strategic and tactical definitions have long been included in American military lexicon, the concept of an operational level of war did not appear in American military doctrine until the 1970s (Naveh, 1997). Since that time, American military doctrine has continually sought improvements to definitions, methodology and processes that link the strategic and tactical aspects of warfare (Naveh, 1997). Descriptions and definitions surrounding the operational level of war have matured over time and the Joint Publication 1-02 *Department of Defense Dictionary of Military and Associated Terms* (JP 1-02) defines three of the most pertinent terms.

- Operational level of war—The level of war at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives within theaters or other operational areas. Activities at this level link tactics and strategy by establishing operational activities needed to achieve the strategic objectives, sequencing events to achieve operational objectives, initiating actions, and apply resources to bring about and sustain these events (JP1-02, 2010).

- Operational art—The application of creative imagination by commanders and staff—supported by their skill, knowledge, and experience—to design strategies, campaigns, and major operations and organize and employ military forces. Operational art integrates ends, ways, and means across the level of war (JP 1-02, 2010).
- Operational design—the conception and construction of the framework that underpins a campaign or major operation plan and its subsequent execution (JP 1-02, 2010).

Joint Publication 3-0 *Joint Operations* (JP 3-0) describes the relation between operational art and design, stating that operational art is used during operational design to construct the operations framework (JP 3-0, 2010). The operational framework is the mental picture that encompasses all activities occurring within the operational level of war, translating strategic guidance into cohesive tactical actions. American military doctrine has traditionally relied upon a linear decision making process to facilitate the activities needed to create and manage this operational framework. This process normally attempts to analyze the tasking, develop and compare alternate courses of action, make a decision and issue tasking (Schmitt, 2006). Since the late 1990s, and in light of experiences in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), many American military thinkers have expressed concerns about the limits of this traditional approach. General James N. Mattis while serving as the Commander, United States Joint Forces Command (USJFCOM) formally endorsed those concerns and declared that the classical decision making process, while useful, needed revamping.

On October 6, 2009, General James N. Mattis published the *Vision for a Joint Approach to Operational Design*. This document highlighted General Mattis' assessment that the “current doctrinal approach to fostering clear, careful thinking and creativity, particularly early in design and planning is insufficient and ineffective” (USJFCOM, 2009). General Mattis continued to explain that:

Standard planning processes, such as the Army’s military decision-making process and the more recent joint operation planning process, have served us well to this point; however, commanders and staffs generally tend to

“over-proceduralize” these processes and use them somewhat mechanically. The complex nature of current and projected challenges requires that commanders routinely integrate careful thinking, creativity, and foresight. Commanders must address each situation on its own terms and in its unique political and strategic context rather than attempting to fit the situation to a preferred template. (USJFCOM, 2009)

In essence, General Mattis issues two challenges to the joint military community. First, he expects commanders to apply creative imagination, which is the essence of operational art, to operational planning. Second, General Mattis challenges the staff of USJFCOM and other doctrine writers to better institutionalize creative imagination through improvements to planning processes by incorporating design. He tasked USJFCOM to advocate for “migrating design-related improvements” to joint doctrine related to operational planning (USJFCOM, 2009).

The United States Field Manual 5-0, *The Operational Process* (FM 5-0) defines design as the “methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them” (FM 5-0, 2010). Design is an attempt to implement the systems philosophy and principles into the art and science of military planning. Design applies systems principles and theory to military planning to help understand the environment and problem holistically as well as conceive a possible solution. Design precedes and complements the more traditional linear planning processes that translate a desired solution into subordinate actions. General James N. Mattis describes design in the *Vision for a Joint Approach to Operational Design*:

Design does not replace planning, but planning is incomplete without design. The balance between the two varies from operation to operation as well as within each operation. Operational design must help the commander provide enough structure to an ill-structured problem so that planning can lead to effective action toward strategic objectives. Executed correctly, the two processes always are complementary, overlapping, synergistic, and continuous. (USJFCOM, 2009)

John F. Schmitt expresses these concepts graphically in *A Systemic Concept for Operational Design* (Schmitt, 2006); see Figure 1.

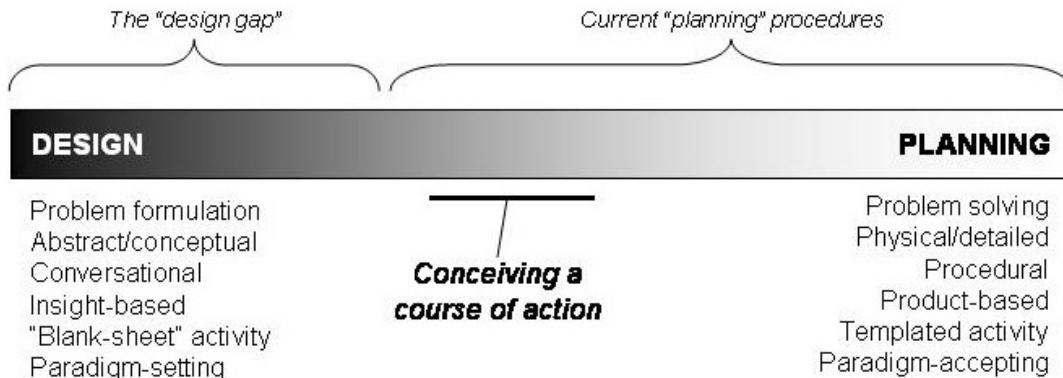


Figure 1. Design-Planning Continuum (From Schmitt, 2006)

Since October 2009, the joint community, U.S. Army and U.S. Marine Corps have continued to develop new processes for operational planning, finally issuing new editions of planning guidance in 2010 that incorporated design. However, a careful read of these new publications yields no fundamentally new process or infusion of creative imagination. In particular, the newly published Marine Corps Planning Process (MCPP) simply recycles the traditional planning process with a focus on group discussion before detail solution planning begins. Planning doctrine seems to lack an institutionalized framework that fosters creative imagination because it fails to implement a methodology founded upon systems philosophy and principles.

In response to General Mattis' challenge and the doctrinal gap of recent planning documents, this thesis proposes an alternative planning framework. A theoretical basis for critique and development of operational planning processes is presented and discussed first. Then, this thesis focuses on the MCPP as outlined in Marine Corps Warfighting Publication (MCWP) 5-1; *Marine Corps Planning Process* released August 24, 2010. This publication edition represents the Marine Corps' attempt to follow General Mattis' direction to incorporate design improvements to the operational planning process. This thesis analyzes the new MCPP from the previously discussed theoretical basis and reviews attempted improvements to other joint and service planning processes. The thesis then proposes an alternative operational planning framework based upon the elements of business design as described by Jamshid Gharajedaghi in *Systems*

Thinking: Managing Chaos and Complexity, A Platform for Designing Business Architecture and elements of Rapid Systems Engineering (RSE) as applied by Professor Gary Langford in the paper *Reducing Risk of New Business Start-ups Using Rapid Systems Engineering*. The proposed framework integrates the best practices of systems architects and business designers to build a methodology that is suited for the most complex situations but is scalable for all levels of command.

B. PURPOSE

The purpose of this thesis is to develop a framework for a USMC planning model. This thesis investigates the feasibility and benefits of applying best practices from the discipline of systems architecting and business design to the military operational planning framework. The planning process combines elements of business design (Gharajedaghi, 2006) and RSE (Langford, 2006) to create a more robust design-planning continuum (Schmitt, 2006). The proposed framework provides another alternative planning model for consideration and possible experimentation for the United States Marine Corps.

C. RESEARCH QUESTIONS

This thesis investigates the following research questions:

1. Is design a valid expression of systems theory and principles to the operational level of war?
2. Does the MCPP correctly integrate design into the planning methodology?
3. Does joint and U.S. Army planning doctrine integrate design correctly?
4. Is it possible to build a robust and scalable operational planning framework based upon elements of business design, RSE and best practices from the discipline of systems architecting?
5. Would this new framework be useful as a starting point for further research and experimentation?

D. BENEFITS OF STUDY

This study adds to existing research and literature that challenges the traditional linear planning processes common in the American military. This thesis evaluates the current MCPP and other planning doctrine from a systems perspective and proposes an alternative framework based on business design, RSE and best practices of systems architecting. This proposed framework could then become a reference point for further design and experimentation that improves how the American military understands, evaluates and plans complex military operations.

E. SCOPE

This thesis focuses primarily on evaluating the MCPP from a systems perspective and proposing an alternative operational planning framework based on business design, RSE and best practices of systems architects. This thesis reviews literature pertaining to design as an expression of the systems philosophy to the operational level of war and conducts a top-level review of other planning doctrine within the Department of Defense.

F. CHAPTER SUMMARY

United States military doctrine expresses warfare on three levels: the strategic, operational and tactical and of the three, the operational level of war is relatively new to American military thought. Since the 1970s, doctrine has continually sought definitions, methods and processes to effectively plan and execute warfare at the operational level. Traditionally, those methods and processes were linear, conforming to the traditional decision making process. In the last ten years, military thinkers have realized the limits of the traditional approach and have investigated new theories and techniques used to develop the operational framework that translates strategic guidance into tactical actions. (USJFCOM, 2009) These new ideas have centered on design, which attempts to apply systems theory and principles to the operational level of war. However, a literature review of MCPP and other planning doctrine that attempts to integrate design proved disappointing and unimaginative. This thesis therefore builds upon current efforts to

apply systems thinking and theory to the operational level of war and proposes an alternative framework based upon business design, RSE and best practices of systems architects.

Chapter II outlines the application of systems principles and theory to the operational level of war. It briefly introduces the operational level of war and analyzes that warfighting discipline through a systems perspective. Chapter II ends with a theoretical framework that is used to analyze current doctrine and build an alternative planning process. Chapter III discusses the MCPP. This chapter critiques its application of systems principles through integration of design to the planning process. Chapter IV reviews joint and U.S. Army planning doctrine, assessing its planning methodology and processes from a systems perspective. The major point for both Chapter III and Chapter IV is to evaluate current planning doctrine in light of the challenge by General Mattis to institutionalize a process that enhances creative imagination during planning. Chapter V presents an alternative planning process based on business design, RSE and best practices from system architects. This process is holistic, scalable and robust enough to meet the planning needs at any level of command. Finally, Chapter VI discusses lessons learned and insights gained from a review of current planning doctrine and the proposed alternate planning framework. This chapter also proposes areas for further research and experimentation.

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II. THE OPERATIONAL LEVEL OF WAR AS A SYSTEM

A. INTRODUCTION

For most of history, warfare consisted of strategy and tactics (Naveh, 1997). Prior to the 1800s, the responsibility for strategic and tactical decisions normally resided in one national leader, either the king or emperor. Normally, the king or emperor would decide on declarations of war, timing for battle, size of armies and objectives with the advice of trusted advisors. The king or emperor would then either closely direct or personally lead his army into battle, directing its tactical deployment and engagement of the enemy possibly supported by the advice of professional soldiers. Under this arrangement, one individual directed the onset of war and all related activities. This relationship worked primarily because of the limited size of the armed forces involved and the resulting limits in time and space. The business of warfare was manageable under a system that focused on strategic objectives supported by direct tactical actions, led by one individual (Naveh, 1997).

After the French Revolution and the new French Republic, the nation's military began to increase dramatically. This dramatic growth in armed forces continued throughout the 19th century and into most of the 20th century, resulting in an increase in the size of war and the resulting time and space consumed by military operations (Naveh, 1997). Under the weight of this new mass, the old systems developed to wage war fell apart. Not all strategic and tactical responsibilities could rest on one individual. The links between strategic objectives and tactical actions were no longer self-evident resulting in a "new problem in the conduct of war, in the intermediate sphere between the traditionally accepted levels of military planning" (Naveh, 1997). Today, the American military identifies this intermediate level of war as the operational level of war, linking strategy and tactics. Chapter II examines this level of war in detail, providing a knowledge baseline for the critique of doctrinal planning processes and for the introduction of a new operational planning framework. This chapter accomplishes three objectives:

1. Summaries the American doctrinal description of the levels of war and analyzes them using a basic black box model.
2. Establishes the operational level of war as a system described by the General Systems Theory.
3. Applies the foundations of Systems Architecting to the operational level of war in order to develop a theoretical framework for analysis and development.

Chapter II establishes the operational level of war as a system that can be designed utilizing the principles of systems architecting as a theoretical foundation.

B. AMERICAN DOCTRINE OF THE OPERATIONAL LEVEL OF WAR

American joint military doctrine articulates three levels of war: strategic, operational, and tactical. Doctrine divides war into three levels to “clarify the links between national strategic objectives and tactical actions” (JP 3-0, 2010). Figure 2 portrays the levels of war graphically. Distinct boundaries between the levels of war do not exist with activities often occurring across the levels of war. Also, there are no particular units, equipment and levels of command associated with a particular level of war (JP 3-0, 2010). The level of war framework is a mental model that supports the understanding, planning, and execution of all activities required to support the human endeavor of war.



Figure 2. Levels of War (From MCDP 1, 1997)

1. The Strategic Level of War

The strategic level of war constitutes all activities that support the establishment of national strategic objectives and allocated resources. In the United States, the President and presidential appointed leadership with advice from military leaders perform these functions. At the strategic level, the President sets national policy either in response to world events or from his/her own initiative and the Secretary of Defense translates Presidential Policy into national strategic objectives (JP-3, 2010). Activities at the strategic level of war involve “establishing goals, assigning forces, providing assets, and imposing conditions on the use of force in theaters of war” (MCDP 1, 1997). Figure 3 represents a black box functional decomposition of the strategic level of war based loosely on the modeling methodology described by Karl T. Ulrich and Steven D. Eppinger in their book, *Product Design and Development* (Ulrich & Eppinger, 2004).

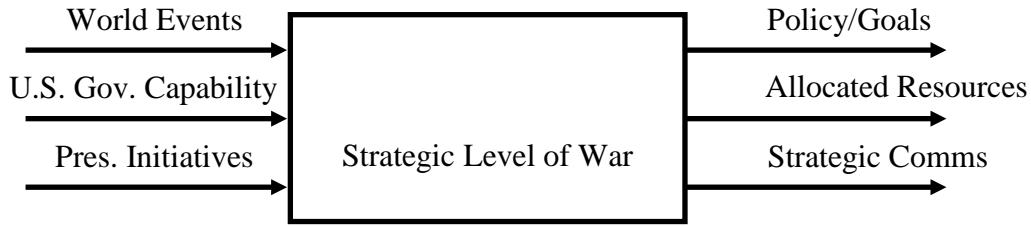


Figure 3. Black Box Functional Decomposition of Strategic Level of War
 (After Ulrich & Eppinger, 2004)

This simple model graphically displays the nominal inputs and outputs associated with the strategic level of war. The inputs and outputs are represented while the black box represents activities involved with developing national and military strategy (Ulrich & Eppinger, 2004). At the strategic level, the capability of the United States government, world and national events, and Presidential initiatives are the major known inputs. The outputs of the strategic level of war are national policy and national goals, allocated government resources for those goals, and a strategic communication and engagement plan. The formulation of strategy is much more complex than represented in Figure 3 because strategic activities must account for the economic situation and ramifications, reactions from friendly nations, and national politics to name a few. However, from this mental exercise one can observe that the inputs and outputs of the strategic level of war are both abstract. National leadership confronts complex situations and makes difficult decisions but generally the output is conceptual and not a real, actionable product. Metaphorically, national leaders conduct art like activities at the strategic level with very little science (Naveh, 1997).

2. The Tactical Level of War

The tactical level of war is the realm of warfighters. At this level, the nation's military accomplishes assigned objectives in order to support operational plans that link to strategic objectives and policy. “The tactical level focuses on planning and executing

battles, engagements and activities to achieve military objectives assigned to tactical units or task forces” (JP 3-0, 2010). Figure 4 represents a black box functional decomposition of the tactical level of war.

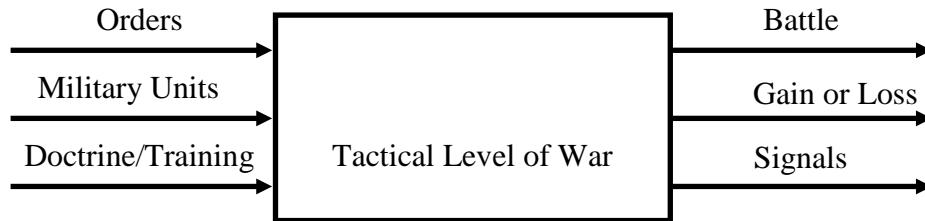


Figure 4. Black Box Functional Decomposition of Tactical Level of War

In the tactical black box model, inputs are operational orders, a definite resource allocation in the terms of a task organization or homogenous military unit and tactical doctrine. The military commander then devises the tactical plan to engage the enemy in battle or accomplish some other assigned mission. The black box output consists of results of the battle or actions taken, a material loss or gain and signals and messages. At a minimum, those signals and messages would involve the local and U.S. populace as well as leadership perceptions and value judgments concerning the results. At the tactical level, commanders operate mostly according to more scientific principles. Commanders receive specific missions and resources and execute according to doctrine and training. Studying this basic black box model, inputs and outputs remain similar, both having mechanical and quantifiable characteristics (Naveh, 1997). This level of war is by no means simple, but here a commander receives actionable instructions, assigned resources and previous doctrine resulting in planned tactical actions.

3. The Operational Level of War

The operational level of war is the intermediate level between strategy and tactics. At this level, military staffs translate strategic goals and objectives into an actionable operations framework, task organization and written orders. The operational level bridges the abstraction of strategy and the mechanical action of tactics (Naveh, 1997). Activities associated with the operational level normally occur on higher military command staffs but can occur at all command levels. The activity at this level utilizes

the military staff's creativity and intellect known as operational art to create an operational design. This operational design is the framework that translates strategic goals into concrete actionable objectives and orders. This mental model is present in the black box functional decomposition of the operational level of war in Figure 5.

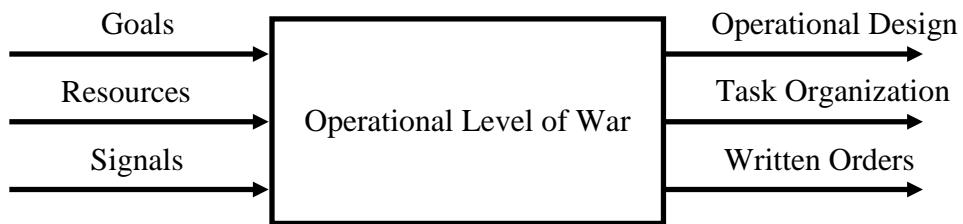


Figure 5. Black Box Functional Decomposition of Operational Level of War

The strategic goals, assigned resources and varying signals constitute the inputs to the operational level of war. Strategic goals and objectives maybe tied to a physical system, such as maintaining a border from an invading force, but historically are often more abstract and open for interpretation. National leadership should define a range of material resources assigned to a particular strategic policy and/or goals, but resource allocation often requires a dialogue that progresses as the operational design is formulated. Finally, signals influencing activities at the operational level of war are too numerous to model here. Commanders and staffs conducting operational planning need to be aware of signals originating on a strategic level such as world opinion to signals residing in the tactical arena such as the opinion of local villagers. Both different types of signals may be crucial to understanding the operational environment and possible solution. The outputs from the operational level of war focus on the physical mechanical world and include the operational design, task organization and military orders for subordinate units. These outputs give concrete direction that drive action. If one considers all the levels of war as one system, it is at this point that the system's operation now passes from the abstract to the physical (Naveh, 1997). If one considers all the activities occurring at the operational level of war as a single system, then it is this system that receives abstract goals and raw materials and creates a physical actionable

plan. This differs from the strategic and tactical system models, where both inputs and outputs are of a similar nature, either abstract or physical.

C. GENERAL SYSTEM THEORY APPLIED TO THE OPERATIONAL LEVEL OF WAR

After presenting each level of war as a black box decomposition model and describing the differences in each, this thesis focuses now on the operational level of war. In particular, this thesis builds upon the work of Shimon Naveh as presented in his book *In Pursuit of Military Excellence, the Evolution of Operational Theory* that applies the General System Theory to the operational level of war (Naveh, 1997). The purpose of this application of the General Systems Theory is to establish the operational level of war as a complex open system thus allowing the introduction of systems principles and architecting to support an overall operational planning framework theory. Once the theory is established, it is used as the basis for evaluation of current military planning doctrine in Chapters III and IV as well as the operational planning framework proposal in Chapter V.

1. General System Theory

Ludwig von Bertalanffy presented the General System Theory in his book entitled *General System Theory, Foundations, Development, Applications* (Bertalanffy, 1968). He defined a system as “a set of elements standing in interrelations” (Bertalanffy, 1968). He also details that the number of elements, the type of elements and their relations create a system and its complexity. The relations have their own defining characteristic. Namely, systems relations exhibit a non-linear property, support the system’s overall purpose and reflect a tension between the system’s abstract purpose and assigned mechanical actions occurring at the subsystem level (Naveh, 1997). Naveh describes this last relation characteristic as “moving the system from a state of abstract, cognitive commonality to a practical course of positive progress” by “translating the overall aim into the concrete objectives and missions for the system’s individual components” (Naveh, 1997). Bertalanffy theorized “there exist models, principles, and laws that apply to generalized systems of their particular kind, the nature of their component elements,

and the relations or “forces” between them” (Bertalanffy, 1968). Benjamin S. Blanchard and Wolter J. Fabrycky discuss the General System Theory in their book *Systems Engineering and Analysis* writing that “General systems theory is concerned with developing a systematic framework for describing general relationships in the natural and the human-made world” (Blanchard & Fabrycky, 2006). Thus, the General System Theory attempts to define and understand a system by applying general insights and lessons learned from studying various systems across disciplines.

2. Operational Level of War as a System

The most detailed application of the General System Theory to the operational level of war is presented by Shimon Naveh. He applies system and interaction characteristics described by the General System Theory to the operational level of war, establishing it as a system requiring a systems perspective for adequate analysis. According to Naveh (Naveh, 1997):

- The operational level of war is an open system, interacting with its environment.
- The fighting mass constitutes the system elements.
- Maneuver provides the interaction among elements.

Maneuver as the medium for interaction, exhibits the characteristics of element relations described in the General System Theory. At the operational level of war:

- The effects of maneuver on military operations are nonlinear.
- The operational framework formulated from strategic goals and missions drives the maneuver of different military elements.
- All element maneuvers must perform mechanical tactical actions directed by operational framework focused on achieving the abstract strategic goals. Therefore, “in a military context, this dichotomy requires the preservation of a controlled disequilibrium between the general aim and the specific missions.” (Naveh, 1997)

In essence, Naveh concludes that the activities occurring at the operational level of war translating abstract strategy to mechanical tactical actions constitute a system as described by the General System Theory. Therefore, to adequately conduct and coordinate all operational activities or study operational art, a framework based on systems principles and experience is required.

D. FOUNDATIONS OF SYSTEMS ARCHITECTING APPLIED TO THE OPERATIONAL LEVEL OF WAR

Chapter II of this thesis has established that:

- The operational level of war differs from the strategic and tactical because it receives abstract strategic guidance but produces mechanical tactical direction.
- All activities that occur at the operational level of war constitute “the implementation of the universal system in the military sphere” (Naveh, 1997).

The next step is to establish a framework that guides the study of military operations and is useful for the development and critique of doctrine related to the planning of military operations. American military doctrine describes operational activities as requiring both elements of art and science (MCDP 1, 1997). Therefore, a foundational operational framework must incorporate and merge artistic and scientific elements to translate abstract strategy into tactical orders and directions. As established in Chapter I, American military doctrine is well equipped to handle the scientific elements of operational planning but lacks the processes to apply artistic creativity to the operational level of war. This doctrinal gap provided the impetus for General Mattis’ challenge to incorporate design into operational planning doctrine (USJFCOM, 2009). However, before a process can be changed or revised, a new relationship paradigm is needed that effectively provides for the application of both art and science to operational planning and for seamless interactions between the two elements. This thesis proposes that the

architect, builder, and customer model provides a rich metaphor for the application of art and science to the operational level of war as well as providing insight into the dynamics of stakeholder relationships and interactions.

The architect, builder, and customer model originated in ancient times, and its application has recently proven useful for the design of organizations and technology oriented systems. Mark W. Maier and Eberhardt Rechtin, in their book entitled *The Art of Systems Architecting*, describe this model and its application to systems other than traditional civil projects. They describe two distinct activities that occur, architecting and engineering:

Generally speaking, engineering deals almost entirely with measureables using analytic tools derived from mathematics and the hard sciences; that is, engineering is a deductive process. Architecting deals largely with unmeasurables using nonquantitative tools and guidelines based on practical lessons learned; that is, architecting is an inductive process. At a more detailed level, engineering is concerned with quantifiable costs, architecting with qualitative worth. Engineering aims for technical optimization, architecting for client satisfaction. Engineering is more a science, architecting more of an art. (Maier & Rechtin, 2002)

In a military context, design represents architecting and scientific-based planning doctrine represents engineering as referred to by Maier and Rechtin. To cope effectively with the operational level of war, doctrine must consist of operational architecting, operational planning and mechanisms that facilitate a seamless communication and transition between the two. For the remainder of this thesis, the author redefines design as operational architecting which is a systems approach that attempts to translate strategic guidance into an operational design as defined in Chapter I. This operational design then becomes the basis for operational planning executed by the classical military planning process. Doctrine must include the two separate but equal activities of architecting and planning into one seamless scalable process. Current doctrine copes well with operational planning but is woefully insufficient to cope with operational architecting. In order to correct this doctrine gap, the American military must first recognize the need for operational architecting and establish a theoretical framework for its development and interaction with operational planning. Operational architecting encompasses all

operational art activities used to create the operational design that represents the environment, situation and concept of solution from a systems perspective. The operational design then becomes the blueprint for all operational planning activities that produces detailed military orders resulting in tactical action. This thesis proposes that the development of operational architecting be built upon the foundations of systems architecting. Maier and Rechtin describe the foundations of systems architecting as a systems approach, a purpose orientation, a modeling methodology, ultraquality implementation, certification and insights and heuristics (Maier & Rechtin, 2002). The following paragraphs apply the foundations of systems architecting to the operational level of war and explore the architecting metaphor in relation to operational stakeholders.

1. A Systems Approach

Maier and Rechtin describe the systems approach as “one that focuses on the system as a whole, particularly when making value judgments (what is required) and design decisions (what is feasible)” (Maier & Rechtin, 2002). Earlier in Chapter II, this thesis described the operational level of war as an application of the General System Theory to warfare (Naveh, 1997). Operational architecting then must focus on the operational level of war as a complete system, seeking to understand the environment, the situation, what is required and what is feasible. Also hidden in the system approach is the requirement to have a shared understanding of the operational system under consideration. This common understanding must be shared between both strategic and operational leadership levels ensuring unity of thought and understanding of the strategic purpose.

2. A Purpose Orientation

Just as in systems architecting, operational architecting must be “a process driven by a client’s purpose or purposes, (Maier & Rechtin, 2002). The purpose of operational architecting is to fulfill strategic direction and guidance. The entire purpose of the operational system is to translate abstract guidance into mechanical tactical direction. Operational architecting must continually ensure that operational planning directs tactical actions that fit into an operational framework fulfilling the strategic purpose. The

strategic purpose is the driving force for military action and must be reflected in all operational activities. A clear understanding of the strategic purpose is also predicated on a common understanding of the current situation and system. As in the systems approach, the shared mental picture is a crucial requirement to fulfilling the strategic purpose.

3. A Modeling Methodology

Modeling is the centerpiece of systems architecting—a mechanism of communication to clients and builders, of design management with engineers and designers, of maintaining systems integrity with project management, and of learning for the architect personally. (Maier & Rechtin, 2002)

Modeling is crucial for operational architecting, just as for systems architecting. Models of the military environment and situation are the tools that establish a shared mental model among all stakeholders. Operational architecting processes do not need to establish a model template only require that models are created and distributed to all stakeholders. These models ensure unity of thought and a shared mental model thus ensuring an accurate understanding of the strategic purpose and overall system. Models are the vehicles that also promote learning among all stakeholders especially when the environment or system changes unexpectedly (Maier & Rechtin, 2002).

4. Ultraquality Implementation

“Ultraquality is defined as a level of quality so demanding that it is impractical to measure defects, much less certify the system prior to use” (Maier & Rechtin, 2002). At first glance, one might assume that this principle does not apply to a military system. However, the principle of striving for a quality solution is very applicable. Operational architecting must strive for perfection knowing it is unobtainable, a system model can never be totally accurate and a solution never optimized. Military professionals are required to strive for quality so demanding that only full solution implementation reveals the deficiencies especially as the system evolves and changes in response to the injection of the operational solution. The concept of ultraquality implement also infers that in a traditional sense, validation of an operational architecture prior to certification may not

be possible. The true validation of the system occurs only after strategic leadership has certified it for use and it is fully implemented. Therefore, the validation of the first iteration occurs during planning for follow on operational designs.

5. Certification

In systems architecting, certification is the “formal statement by the architect to the client or user that the system, as built, meets the criteria both for client acceptance and for builder receipt of payment, i.e., it is ready for use (to fulfill its purposes)” (Maier & Rechtin, 2002). Certification for operational architects occurs when strategic and operational leadership share a common understanding of the military situation and solution and how strategic guidance will be satisfied. Leadership then certifies the operational framework for implementation. For military operations, certification will occur at both operational and strategic levels. The principle however, is that the appropriate level of command certifies the work of the operational architect and agrees with the common situation and solution models thus allowing the planners to begin work on engineering the corresponding campaign or operation.

6. Insights and Heuristics

It is widely acknowledged that successful military commanders often exercise great insight into military matters, whether from experience, study or ability. The same is true for operational architects. The situations, environment and stakeholders that constitute the military area of operations are so complex, analytical methods alone are inadequate. Oftentimes, the only tool available to the operational architect will be insight. Maier and Rechtin define insight as “the ability to structure a complex situation in a way that greatly increases understanding of it” and “is strongly guided by lessons learned from one’s own or others’ experiences and observations” (Maier & Rechtin, 2002). Therefore, it is incumbent upon doctrine to capture operational insights into heuristics, “succinct expressions” that express the meaning of lessons learned (Maier & Rechtin, 2002). These heuristics will serve as tool kit to assist the operational architect during all phases of the operation and campaign. Many found in systems architecting are directly applicable to military operations, others will have to be created over time through

study of military campaigns from an operational architecting framework. Either way, operational heuristics need to be collected and understood in order to serve as an integral tool for the operational architect.

7. Architecting Metaphor Applied to Operational Stakeholders

The architect, builder and customer model not only applies art and science to the planning of military operations but greatly assists in clarifying relations between stakeholders in the operational context. In an attempt to understand roles and responsibilities, it is advisable for operational architects to list all stakeholders and assign a role in the architect, builder, and customer model. Among the most important are the client, architect, project manager, technical artisan, user, neighbor, and stock holder. The list is actually only limited by the imagination. Once roles are assigned, relationships and dynamics will become much clearer. It also helps to determine whose value judgments matter. As a case in point, the local populace is not a client of the military commander but their value judgment is paramount. System learning is definitely facilitated by understanding stakeholders and their relationships according to a commonly understood model. A planning process should not mandate a template for stakeholder analysis; only provide examples and heuristics for the architecting team.

E. CHAPTER SUMMARY

The American doctrinal description of the operational level of war encompasses the activities that translate strategic guidance to mechanical tactical action. According to Shimon Naveh, the operational level war constitutes a system as described by Ludwig Bertalanffy's General System Theory. Accordingly, it requires a systems-based approach for understanding, planning and execution. Present doctrine acknowledges this systems-based approach but uses only scientific planning processes to meet the challenge presented by the complexity of the military operations sphere. American military planning doctrine neglects to include any process that would apply artistic creativity to the operational level of war, leaving planning staffs to their own abilities and ideas. Recently, senior military leadership identified the doctrine deficiency and tasked different organizations with establishing a more comprehensive planning process that applies the

art and science to the operational level of war (indicated in Chapter I). The thrust of Chapter II described this thesis' foundational theory for operational planning based upon the premise that the operational level of war is a system as defined by the General System Theory and that elements of art and science are required to adequately cope with the complexity of military operations. As a result, Chapter II concluded that any operational planning process should:

- Be built upon the architect, builder and customer model
- Utilize the separate but equal activities of operational architecting (analogous to design) and operational planning.
- Utilize current military decision making processes for operational planning.
- Utilize the foundations of systems architecting to develop doctrine and processes for operational architecting.
- Provide for the seamless communication and interaction between architecting and planning activities.

Chapters III and IV will evaluate present day operational planning doctrine's fulfillment of senior level direction to incorporate design and compliance with the theoretical points summarized above. Chapter V will present an alternate planning process founded on the theory established in Chapter II as well as from concepts found in business design, RSE and best practices from system architects. Finally, Chapter VI will evaluate the lessons learned during this thesis and recommended areas for further research.

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III. MARINE CORPS PLANNING DOCTRINE AND PROCESSES

A. INTRODUCTION

USMC doctrine consists of Marine Corps Doctrinal Publications (MCDPs), Marine Corps Warfighting Publications (MCWPs), Marine Corps Regulation Publications (MCRPs) and Marine Corps Interim Publications (MCIPs). MCDPs are the highest level of USMC doctrine and consist of two groups; those that describe the “enduring beliefs of warfighting” and those that provide the “guiding doctrine for the conduct of major warfighting activities” (HQMC, Deputy Commandant for Combat Development & Integration, 2011). The only exception to this is MCDP 1–0 *Marine Corps Operations*, which “translates the philosophical-based capstone/keystone publications into operational doctrine” (HQMC, Deputy Commandant for Combat Development & Integration, 2011). MCWPs are one level below and describe specific tactics, techniques and procedures (TTPs) specific to certain missions or warfighting areas. MCRPs either supplement the MCWPs, containing information that is more detailed, or present general reference or historically significant material. Finally, MCIPs capture TTPs learned from recent experiences or research for timely distribution as USMC evaluation continues (HQMC, Deputy Commandant for Combat Development & Integration, 2011). The major publications from the USMC Doctrine Hierarchy that describe USMC planning theory and processes are MCDP 1 *Warfighting*, MCDP 1–0 *Marine Corps Operations*, MCDP 5 *Planning* and MCWP 5–1 *Marine Corps Planning Process*. Figure 6 graphically displays the relationships and corresponding levels of all USMC doctrine related to operational planning.

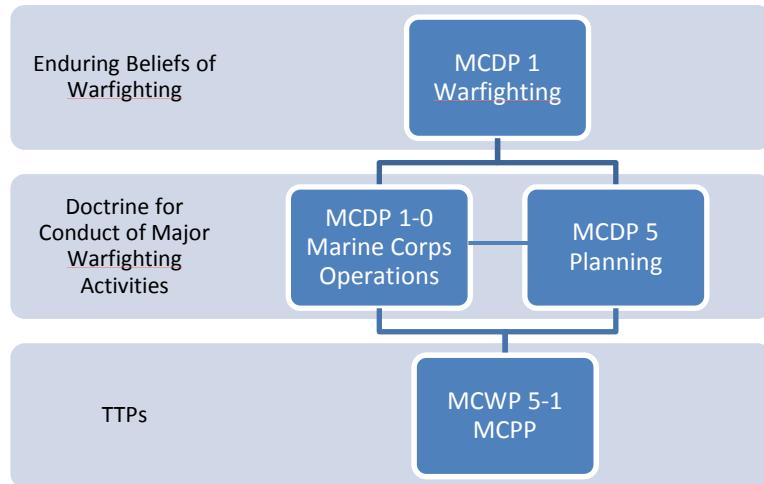


Figure 6. Planning Doctrine Roadmap (After HQMC Deputy Commandant for Combat Development and Integration, Marine Corps Doctrinal Publications)

In order to understand both USMC planning theory and the USMC planning process, Chapter III analyzes all publications presented in Figure 6 because no one document presents a unified planning theory and process. MCDP 5 presents a planning theory based on the classical decision-making process and the characteristics of a successful plan. MCDP 1 discusses the conceptual role of planning in warfighting whereas MCDP 1–0 attempts to present what planning must do and achieve operationally in support of military operations. MCWP 5–1 describes the USMC process that a commander and staff should follow in order to plan a military operation. Therefore, this chapter first summarizes the planning concepts and theory presented in MCDP 1, MCDP 5 and MCDP 1–0 that together form the intellectual foundation for the MCPP. Next, this chapter discusses the MCPP, establishing how it builds a planning process for USMC commanders and staff that is based upon its intellectual underpinnings. Once the USMC planning theory is articulated and the process analyzed, this thesis presents a comparison between the USMC planning system and the operational planning framework established in Chapter II based on the architect, builder and customer model. The final objective of this chapter is to evaluate the effectiveness of Marine Corps efforts to incorporate the concepts and elements of operational design into the MCPP in compliance with General Mattis' *Vision for a Joint Approach to Operational Design* and to determine if an alternative operational planning model is needed.

B. MARINE CORPS PLANNING THEORY

The Marine Corps planning paradigm begins with foundational warfighting concepts pertinent to planning which influence planning theory that then become operational planning concepts. This thesis describes the Marine Corps planning paradigm using a building block approach focused on MCDP 1, MCDP 5 and MCDP 1–0. The first step is to discuss foundational warfighting concepts pertinent to planning from MCDP 1. Next, Marine Corps Planning Theory is analyzed as described in MCDP 5. Finally, this thesis discusses how Marine Corps Planning Theory influenced and shaped operational planning concepts in MCDP 1–0. A final consolidate theory requires a discussion of all three documents.

1. MCDP 1 *Warfighting*

A military organization's philosophy of war influences every activity in that organization. In MCDP 1, the USMC presents its war philosophy. Within that philosophy, three elements most influence the Marine Corps Planning Theory (MCDP 1, 1997):

- The complexity of war
- The science and art of war
- Centrality of the commander.

MCDP 1 describes war as a “complex phenomenon” (MCDP 1, 1997). MCDP 1 continues to explain that “as a result, war is not governed by the actions or decisions of a single individual in any one place but emerges from the collective behavior of all the individual parts in the system interacting locally in response to local conditions and incomplete information” (MCDP 1, 1997). Describing war as a system that is complex because of interactions among its parts, lays the foundation for a systems perspective and approach. In response to MCDP 1, Marine Corps planning theory should also reflect a systems perspective because that is how war is described in doctrine. MCDP 1 continues to describe war as encompassing both art and science elements (MCDP 1, 1997). MCDP 1 “concludes that the conduct of war is fundamentally a dynamic process of human

competition requiring both the knowledge of science and the creativity of art but driven ultimately by the power of human will” (MCDP 1, 1997). In response to this concept, planning theory must cope with the art and science elements associated with conducting and planning warfare. Artistic elements may include novel problem definitions and conceptual solutions resulting from a unique grasp of the situation where as the detailed planning need to phase forces into a military operations area with limited transportation assets is an example of scientific elements in planning. Planning processes and theory must provide mechanisms for operational architecting (artistic elements), operational planning (scientific elements) and their interaction. Finally, MCDP 1 describes the centrality of the commander to all warfighting activities (MCDP 1, 1997). The commander is central to the organization structure, planning and action. Therefore, a USMC planning theory must describe his or her lead role in all planning activities. In summary, in order for Marine Corps Planning theory to be consistent with Marine Corps warfighting philosophy, Marine Corps Planning theory must:

- Cope with war as a complex system
- Apply both art and science to the planning and execution of warfare
- Establish the commander as the central participant in planning.

2. MCDP 5 *Planning*

The foreword of MCDP 5 explains that the “publication describes the theory and philosophy of military planning as practiced by the U.S. Marine Corps” (MCDP 5, 1997). MCDP 5 consists of three chapters: chapter 1, The Nature of Planning; Chapter 2, Planning Theory; and chapter 3, Planning Effectively. Chapter 1 defines planning and plans as well as general characteristic of the process. Chapter 3 presents characteristics of good plans and the relationship between the commander and planners. This thesis focuses on Chapter 2, as it presents the theory behind the Marine Corps Planning Process.

After reviewing MCDP 5, the foundational elements of the Marine Corps Planning Theory are the classical decision-making process, analysis and synthesis, the

centrality of the commander and a tactical focus. The Marine Corps Planning theory is built upon the classical decision making process, as presented in Figure 7.

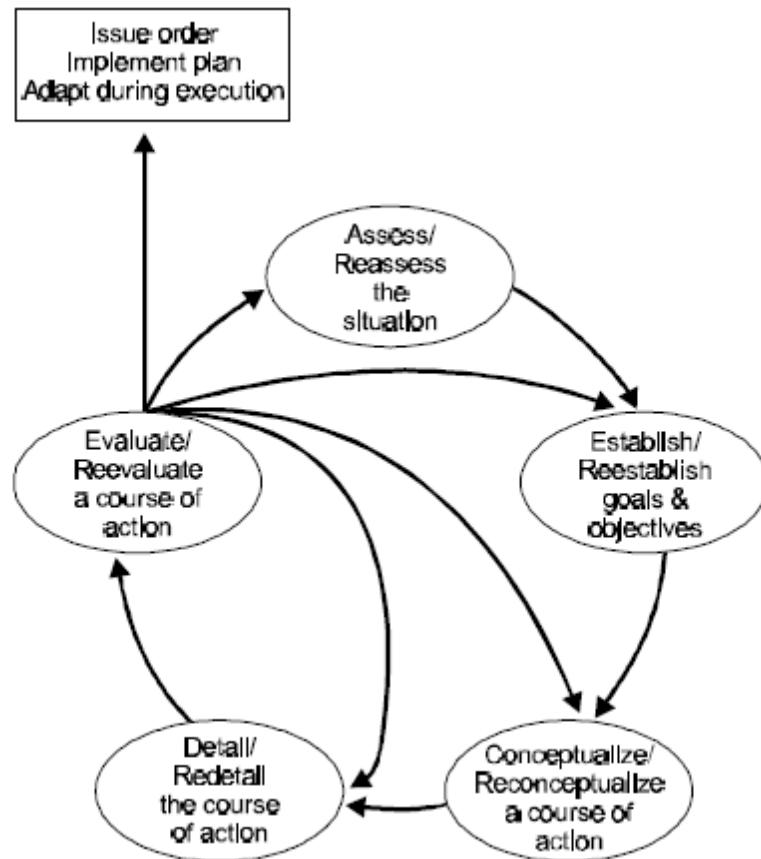


Figure 7. MCDP 5 Planning Process (From MCDP 5, 1997)

Figure 1 depicts the classical linear decision-making process described in Chapter I of this thesis. This graphic represents different iterations by showing the linear process in a cycle. This process is used to manage both analysis and synthesis activities. MCDP 5 defines analysis as “the systematic process of studying a subject by successively decomposing the subject into parts and dealing with each of the parts in turn” (MCDP 5, 1997) and synthesis as the “creative process of integrating elements into a cohesive whole” (MCDP 5, 1997). Therefore, MCDP 5 describes the science of war as analysis and the art of war as synthesis. To translate the concepts of analysis and synthesis to actual activities, MCDP 5 relates these concepts to actual activities mapped as the

hierarchy of planning, consisting of the conceptual, functional and detailed levels. Conceptual planning is the highest level of planning primarily requiring synthesis activities while detailed planning is at the bottom of the hierarchy, primarily requiring analysis activities. Functional planning is the middle level requiring elements of art and science. According to Marine Corps planning theory, the higher levels of the planning hierarchy require more synthesis whereas lower levels require more analysis (MCDP 5, 1997). Figure 8 presents the Marine Corps planning hierarchy.

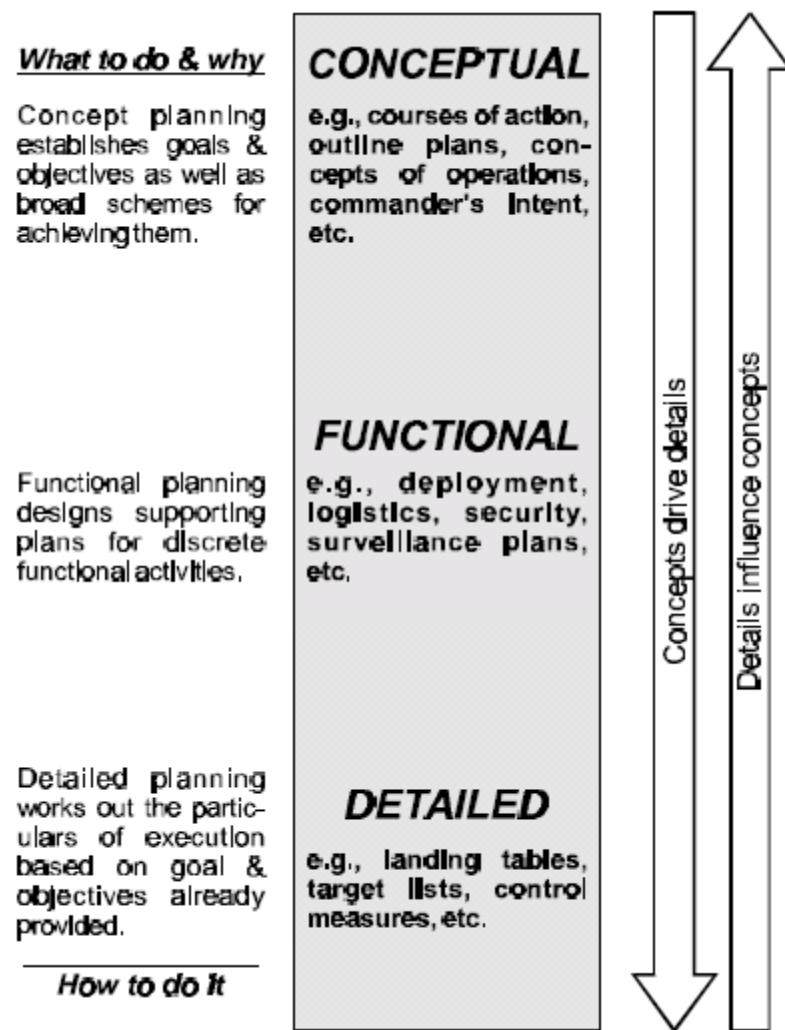


Figure 8. MCDP 5 Planning Hierarchy (From MCDP 5, 1997)

Central to the planning hierarchy and the application of art and science, is the role of the commander. Marine Corps planning theory centers on the commander. He or she is primarily responsible for conceptual planning while functional and detailed planning activities are delegated to the staff (MCDP 5, 1997). Therefore, according to theory, one could easily infer that the commander focuses on the art of war and the staff focuses on the science of war. Finally, Marine Corps Planning theory focuses on the tactical level. The introduction explains, “The focus here is on operation planning, especially at the tactical level” (MCDP 5, 1997). Overall, MCDP 5 does not elaborate on all MCDP 1 warfighting concepts related to planning. MCDP 5 does attempt to apply both art and science to warfare and establish the commander as the central figure, but fails to articulate a theoretical framework that copes with operational war as a complex system. These shortcomings carry over to MCDP 1–0.

3. *MCDP 1–0 Marine Corps Operations*

MCDP 1–0 “represents how our warfighting philosophy is codified in operational terms” and “is the transition-the bridge-between the Marine Corps’ warfighting philosophy of maneuver warfare to the TTP used by Marines” (MCDP 1–0, 2001). For the Marine Corps, MCDP 1–0 is part theory and part operational. It is important to analyze this document as it is the step from planning theory presented in MCDP 1 and 5 to the planning process presented in MCWP 5–1.

MCDP 1–0 translates planning theory into more operational specifics by codifying the central role of the commander and summarizing the planning hierarchy. MCDP 1–0 follows suit with MCDP 5 and delegates most of conceptual planning and the artistic elements of war to the commander. This is codified in what MCDP 1–0 describes as the operational design. MCDP 1–0 uses this term differently than defined by JP 1-02. MCDP 1–0 defines operational design as “the commander’s tool for translating the operational requirements of his superiors into the tactical guidance needed by his subordinate commanders and staff. The commander uses his operational design to visualize, describe, and direct those actions necessary to achieve his desired end state and accomplish his assigned mission. The operational design includes the purpose of the

operation, what the commander wants to accomplish, the desired effects on the enemy, and how he envisions achieving a decision” (MCDP 1–0, 2001) In essence, MCDP 1–0 requires the commander to apply the art of war in order to understand the environment, situation and conceptual solution alone without staff assistance. MCDP 1–0 describes the commander as the lone conceptual planner with the details left for the staff. In practice, commanders do not perform all conceptual planning alone and most likely the commander’s staff is involved from the beginning. However, if the Marine Corps followed its doctrine closely, the commander would essentially frame the environment, situation and conceptual solution almost entirely alone.

4. Summary

In summary, Marine Corps Planning Theory focuses on the classical decision model, the central role of the commander in planning, and applying the art and science of warfare to planning. MCDP 1 describes war as a complex system but neither MCDP 5 nor MCDP 1–0 expands this concept. The Marine Corps planning theory focuses on the commander’s application of the art of war and the staff’s application of the science of war within the context of the classic decision making model. MCWP 5–1 develops this overarching theme into an operational planning process.

C. MARINE CORPS PLANNING PROCESS

MCWP 5–1 *Marine Corps Planning Process* was published on August 24, 2010 and consists of six steps; Problem Framing, Course of Action (COA) Development, COA Wargaming, COA Comparison and Decision, Orders Development and Transition. The 2010 edition represents the Marine Corps’ effort to respond to General Mattis’ direction and incorporate design into the traditional process. The most substantial change from earlier editions occurred in the first step of Problem Framing and is discussed in detail. The remaining steps represent the classical decision making process and have been unchanged from the original edition. Figure 9 presents the MCPP graphically.

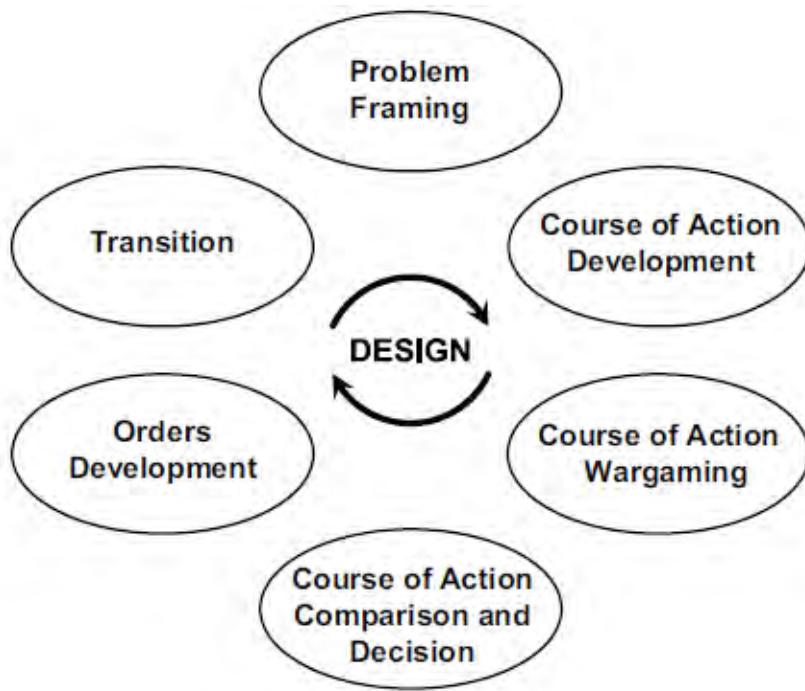


Figure 9. Overview of the Marine Corps Planning Process
 (From MCWP 5–1, 2010)

1. Problem Framing

According to MCWP 5–1, “problem framing enhances understanding of the environment and the nature of the problem. It identifies what the command must accomplish, when and where it must be done and, most importantly, why—the purpose of the operation” (MCWP 5–1, 2010). Figure 10 graphically shows the injects, activities, and results for the Problem Framing step.

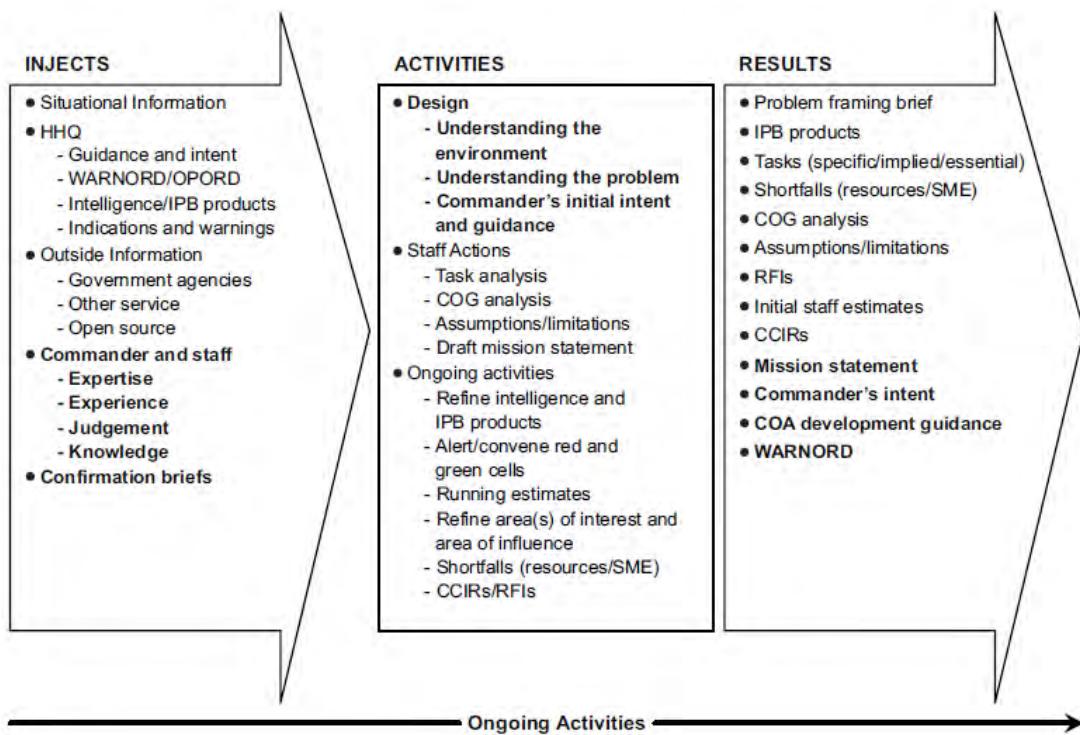


Figure 10. Injects, Activities, and Results Diagram for Problem Framing
(From MCWP 5–1. 2010)

The injects to the problem framing step include any relevant situational information, guidance from higher headquarters, outside research, knowledge and judgment of the commander and his staff and finally any planning confirmation briefs received. The commander and staff then uses these inputs to conduct the problem framing activities. These activities focus on open dialogue concerning the problem under the banner of design and more traditional mission analysis activities such as center of gravity analysis and task analysis. Finally, the commander and staff produce a problem framing brief that includes traditional planning products such as a tasks list, centers of gravity, a mission statement and a warning order instructing subordinate units to begin planning. However, no design or problem model is required before moving on in the planning process.

Originally, the first step of the MCPP was Mission Analysis. The 2010 edition of the MCPP changed the first step to Problem Framing with new orientation on dialogue and discussion between the commander and staff. The first step of MCPP recommends

dialogue and discussion in design activities. However, the commander is still responsible for the commander's initial intent and guidance (MCWP 5-1, 2010). Once the design activities are finished, the remaining activities may be classified as staff and ongoing activities and constitute functional and detailed planning. The major change in the 2010 MCPP is the staff's inclusion in conceptual planning, described as design activities. However, after that dialogue there are no outputs required. The discussion and work is solely for the benefit of the commander and his mental model. Models of the environment, situation and conceptual solution are not required. The output requirements are listed in the results section of Figure 10. These outputs are focused on providing input to the next step and not a true understanding of the operational level of war as a system. After the Problem Framing step, the MCPP does not encourage the application of creative art but becomes mechanical actions based on the classical decision making process focused on producing tactical orders.

2. Summary

Overall, the MCPP reflects most elements of Marine Corps planning theory. It maintains the central role of the commander in the conceptual planning but only focuses on applying creative art to the operational plan in the first step of the process. The remaining steps mechanically focus on producing tactical orders. The MCPP is based metaphorically on an assembly line. The goal is production of a product not necessarily on understanding a complex system.

D. COMPARISON BETWEEN MCPP AND THE ARCHITECT, BUILDER AND CUSTOMER MODEL

Major differences exist between the MCPP and the planning theory present in Chapter I. First, the Marine Corps planning theory and process is established on a production metaphor (classical decision-making model) vice a relationship metaphor (architect, builder, and customer model). This tends to make tactical orders the goal vice system understanding. The MCPP, by utilizing the production metaphor, misses the richness afforded by the architect, builder, and customer model when analyzing stakeholders and their interactions. The MCPP also focuses primarily on operational

planning and makes little effort to incorporate operational architecting. The only architecting activities occur in the Problem Framing step of MCPP but mostly in an informal manner. MCPP is also not system oriented nor presents a modeling methodology. The theory articulates a systems approach but the actual process does not follow a systems approach and no shared mental models are constructed and distributed to senior and subordinate commands. Discussions of the environment and situation are informal and result in no tangible product. MCPP does well managing the operational planning activities required to generate tactical orders. However, good planning cannot compensate for bad or missing architecture.

E. CONCLUSION

The Marine Corps Planning Theory and Process are based upon the classic commander centric decision-making process, and tackle the activities associated with the science of war very well. The Marine Corps' theory stresses that war is a complex system but the process has no means of coping with the operational level of war from a systems approach. The MCPP focuses on producing tactical orders but not system understanding. The process does not provide mechanisms to conduct operational architecting and translate those ideas to operational planning. The MCPP allocates very little effort understanding the environment, situation and conceptual solution but focuses on producing an optimal solution and the required tactical orders. During the process, the preponderance of effort (steps two through five) deals with the details of the solution. The Marine Corps Planning Theory and Process provide well for planning at the tactical level where the system is easily understood from experience or previous study. However, it is at the higher levels where its weaknesses come out. The MCPP lacks robust tools and applications for creating an operational architecture. Thus, even the most well crafted plans can fail because they solve the wrong problem. Overall, the MCPP fails to integrate the creative art into operational planning. The author believes another planning process based on theory presented in Chapter II is needed to meet the challenge from General Mattis.

IV. JOINT AND U.S. ARMY PLANNING DOCTRINE

A. INTRODUCTION

In the summer of 2010, the author of this thesis reported to the United States Marine Corps Command and Staff College. The curriculum consisted of three blocks of instruction: operational art, cultural and interagency operations and warfighting. The curriculum also included numerous planning exercises designed to provide the students hands on training in the Marine Corps Planning Process and an opportunity to incorporate lessons learned from the other blocks of instruction. During this year at USMC Command and Staff College, the author was first exposed to operational design and the *Vision for a Joint Approach to Operational Design* published by General Mattis in October 2009. Since that time, the USMC published a revised MCWP 5-1 that was discussed in Chapter III. This revision did little to incorporate operational design, making only minor changes to the previous document and process. The joint community and U.S. Army in comparison have made much more progress incorporating operational design into their planning theory and processes. Chapter IV will survey the latest publications describing joint and U.S. Army planning in order to briefly describe their respective processes and compare those processes to the MCPP and the planning theory presented in Chapter II. This survey and these comparisons will assist the reader in further understanding the need behind specific aspects of the alternate planning model presented in Chapter V.

B. JOINT PUBLICATION 5-0, *JOINT OPERATION PLANNING*

The preface of JP 5-0 explains that “Joint Publication 5-0, *Joint Operation Planning*, reflects current guidance for planning military operations and, as a keystone publication, forms the core of joint doctrine for joint operation planning throughout the range of military operations” (JP 5-0, 2011). JP 5-0 is the definitive document for joint operation planning for the United States military (JP 5-0, 2011). The 2011 edition of JP 5-0 contains major revisions in relation to design from the edition released in December 2006 (JP 5-0, 2011) and is the topic of analysis for this section.

1. Joint Operation Planning Activities, Functions and Products

“Joint operation planning encompasses a number of elements, including three broad operational activities, planning functions and a number of related products” (JP 5-0, 2011). Figure 11 presents an overview of the operational activities, planning functions and associated planning products that constitute the joint operation planning.

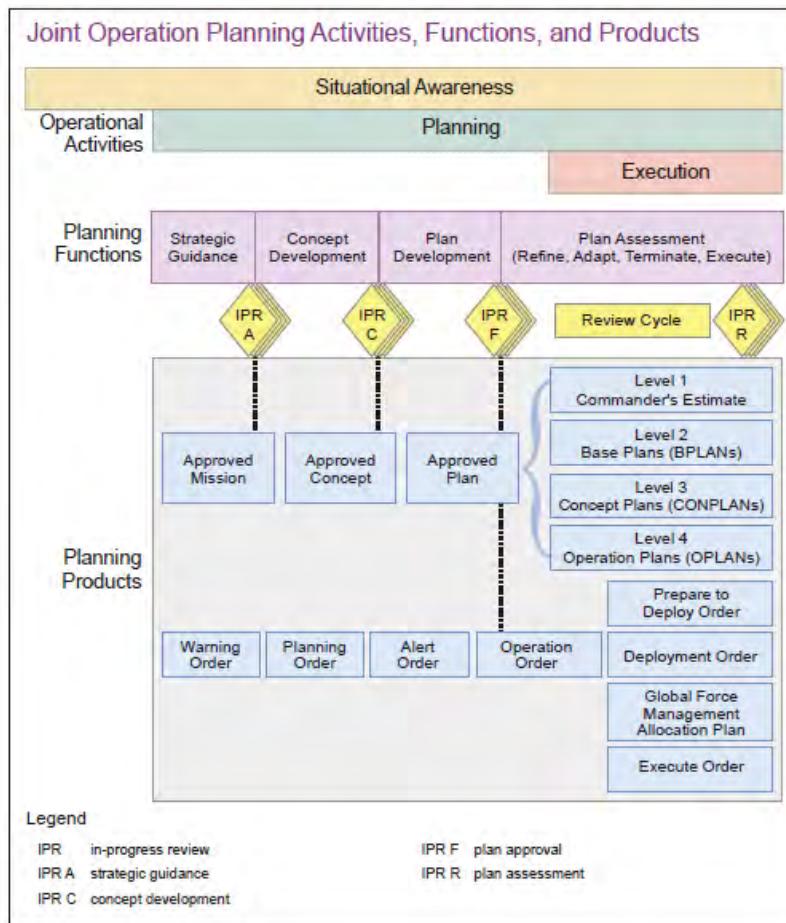


Figure 11. Joint Operation Planning Activities, Functions, and Products
(From JP 5-0, 2011)

Three joint operational activities form the beginnings of joint operation planning. Situational Awareness defines the first operational activity and includes all “procedures for describing the operational environment, including threats to national security” (JP 5-0, 2011). For commanders and staff, activities establishing situational awareness are wide-ranging and continuous as the commander struggles to understand the assigned

environment. The next operational activity, planning, “translates strategic guidance and direction into campaign plans, contingency plans, and operation orders (OPORDS)” (JP 5-0, 2011). In a joint environment, planning usually is conducted in response to either received national strategic direction or in anticipation of questions from strategic leadership based on world events. According to JP 5-0, planning consists of the broad four functions presented in Figure 11; strategic guidance, concept development, plan development and plan assessment. Design and the Joint Operation Planning Process (JOPP) are the two distinct types of activities used by the commander and staff during each planning function to produce the associated planning products for review and execution as presented in Figure 11. Table 1 lists each planning function, the purpose, the primary output and the corresponding activity whether it be design, JOPP or a combination.

Planning Function	Purpose	Output	Activity
Strategic Guidance	Ensure all stakeholders understand strategic guidance and way ahead	1. Agreed upon list of assumptions used for this planning function 2. Conclusions about “nature of problem” (JP 5-0, 2011) 3. Strategic and military end states 4. Commander’s mission statement	Design
Concept Development	Develop multiple courses of action (COAs) for review and receive approval for one COA development	“COA approved for further development” (JP 5-0, 2011)	Design and JOPP as appropriate
Plan Development	Develop a complete plan based on approved COA	Approved Plan or Order	JOPP
Plan Assessment	Commander continually assess environment and plan to determine if plan should be refined, adapted, terminated, or executed.	1. Refined plan (minor changes) 2. Adapted plan (major changes) 3. Plan terminated 4. Plan executed	Design and JOPP as appropriate

Table 1. Description of Joint Planning Functions (After JP 5-0, 2011)

Finally, the last operational activity is execution and execution “begins when the President decides to use a military option to resolve a crisis” (JP 5-0, 2011).

2. Design and JOPP

The following quote from JP 5-0 describes exactly the required interaction between operational art, operational design and JOPP in order to accomplish joint operation planning.

The JFC (Joint Force Commander) and staff develop plans and orders through the application of operational art and operational design and by

using JOPP. They combine art and science to develop products that describe how (ways) the joint force will employ its capabilities (means) to achieve the military end state (ends). The interaction of operational art and operational design provides a bridge between strategy and tactics, linking national strategic aims to tactical combat and noncombat operations that must be executed to accomplish these aims. (JP 5-0, 2011)

JP 5-0 advocates the use of two distinct processes to accomplish joint planning, design and JOPP. JP 5-0 never offers a definition of design but functionally defines design as the use of operational art to produce an operational design (JP 5-0, 2011). This is also in line with the definition from FM 5-0 that defines design as the “methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them” (FM 5-0, 2010). According to JP 5-0, the design activity produces an operational design, which is “the conception and construction of the framework that underpins a campaign or major operation plan and its subsequent execution” (JP 1-02, 2010). The operational design must (JP 5-0, 2011):

- Understand the strategic direction. (What are the strategic goals to be achieved and the military objective that support their attainment?)
- Understand the operational environment. (What is the larger context that will help me determine our problem?)
- Define the problem. (What problem is the design intended to solve?)
- Develop an operational approach.

The operational approach is the key element of the operational design that is then developed through application of the JOPP into an actionable order or plan. JP 5-0 concludes its description of the design activity by offering suggested elements that can be used within the operational design “to develop and refine the commander’s operational approach” (JP 5-0, 2011). Figure 12 lists the elements of operational design.

Elements of Operational Design

- Termination
- Military end state
- Objectives
- Effects
- Center of gravity
- Decisive points
- Lines of operation and lines of effort
- Direct and indirect approach
- Anticipation
- Operational reach
- Culmination
- Arranging operations
- Forces and functions

Figure 12. Elements of Operational Design (From JP 5-0, 2011)

A definition of each element is not necessary in this thesis, but it is worth noting that the elements are not tied to a planning theory or process, but are generally a collective list of ideas and tools used during American military planning for years. It is possible that these elements are simply a holdover from previous doctrine and constitute a list of tools familiar to most military planners.

The second distinct process used by JP 5-0 to accomplish joint operation planning is JOPP. It is defined as “an orderly, analytical process, which consists of a set of logical steps to examine a mission; develop analyze, and compare alternative COAs; select the best COA; and produce a plan or order” (JP 5-0, 2011). Figure 13 presents the JOPP.

Joint Operation Planning Process

Step 1	Planning Initiation
Step 2	Mission Analysis
Step 3	Course of Action (COA) Development
Step 4	COA Analysis and Wargaming
Step 5	COA Comparison
Step 6	COA Approval
Step 7	Plan or Order Development

Figure 13. Joint Operation Planning Process (From JP 5-0, 2011)

JOPP is modeled after the classical decision making process and remains unchanged from the previous edition of JP 5-0 issued in December 2006. Finally, Figure 14 graphically represents the interaction between operational art and detailed planning activities used during joint operation planning.

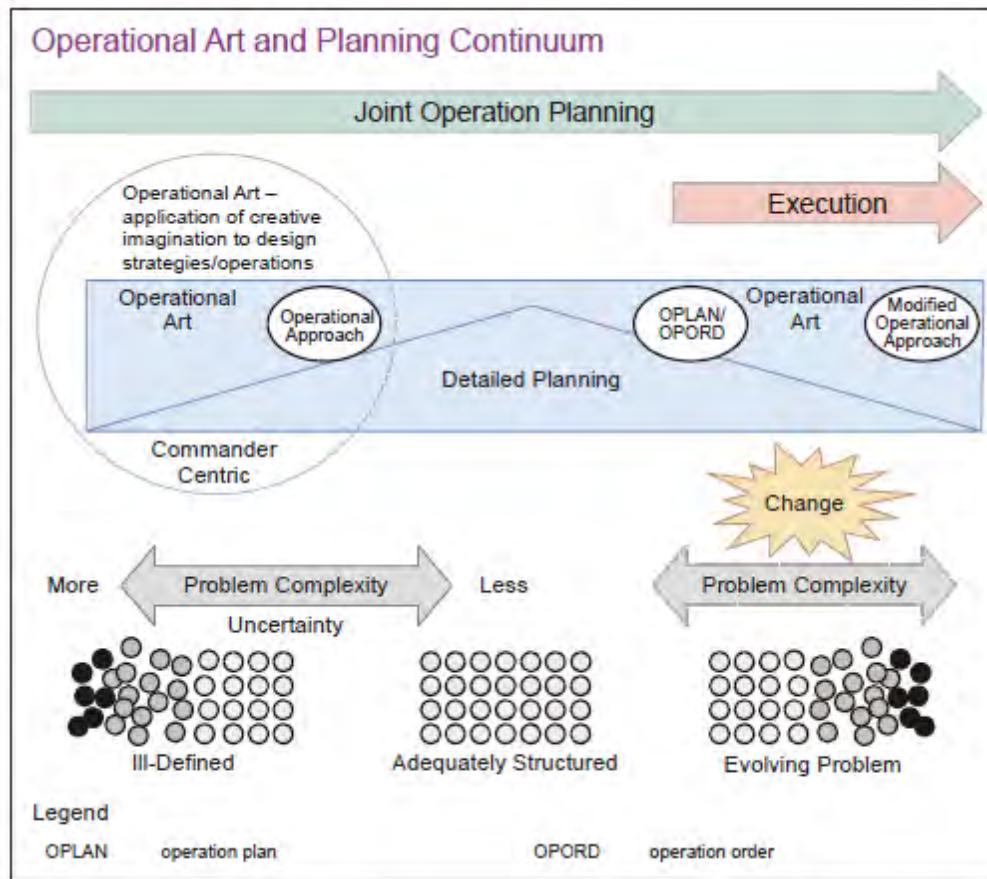


Figure 14. Operational Art and Planning Continuum (From JP 5-0, 2011)

This graphic is similar to the Design-Planning Continuum present in Chapter I from John Schmitt (Schmitt, 2006). Even though not listed in Figure 14, operational art occurs during Design whereas detailed planning is accomplished by application of the JOPP. Figure 14 shows graphically the level of effort invested in either Design or JOPP based on the complexity and structure of the problem. When the problem is less structured and ill-defined, design is required to understand the strategic guidance, the environment, the problem and develop an operational approach that then becomes the basis for the JOPP. However, if the problem is well understood and relatively well

structured, commanders may focus most efforts on the immediate application of the JOPP. Figure 14 demonstrates the scalable quality of the doctrine described in JP 5-0. A commander, based on his unique situation, is encouraged to use doctrine, not as checklist, but as a guide to plan and manage joint operations.

3. Critique of JP 5-0, *Joint Operation Planning*

Overall, JP 5-0 makes tremendous strides in correctly incorporating design into the traditional planning process. Joint operation planning as described in JP 5-0 is conducted through a combination of design and JOPP. Design roughly equates to the operational architecting activity presented in Chapter II and JOPP performs the role of detailed operational planning. JP 5-0 design activities incorporate some of the elements of operational architecting discussed in Chapter II, mainly a systems approach, a purpose orientation, a modeling methodology and certification.

Even though not explicitly built upon a systems approach, JP 5-0 does employ systems concepts. It seeks to approach the operational level of war as a complete system attempting to collectively understand strategic direction, the operational environment, the problem and develop an operational approach (JP 5-0, 2011). Design as described in JP 5-0 seeks to establish and communicate a shared understanding of the system and proposed solution. This is also facilitated by the In Progress Reviews (IPRs) with the joint commander and strategic leadership, graphically displayed in Figure 11. Along with a systems approach, these IPRs ensure a purpose orientation. The planning process outlined in JP 5-0 definitely ensures that the system model, conceptual solution and detailed plan is consistently reviewed and approved by strategic leadership. Mechanisms put in place by JP 5-0 should ensure the joint commander and national civilian leadership collectively agree on the problem to be solved and the proposed solution. Also, the IPRs and design activities described in JP 5-0 required the production and communication of models. The commander and staff are required to communicate at each point in the process their understanding of the strategic guidance, a proposed solution, detail plan and assessment. These activities have to include the production of mental models that will be approved by the commander, communicated and either rejected or accepted by strategic

leadership. This dialogue is very similar to the dialogue between the customer, architect and builder. Metaphorically depending on the planning activity, the commander plays both the role of the architect and builder communicating the design and detailed plans to the customer, strategic leadership. Finally, the process described in JP 5-0 includes

certification. JP 5-0 provides a prescribed process for the commander to certify his or her operational design and detailed operational plan to strategic leadership. Execution then is a decision of the President alone.

JP 5-0 also has multiple strengths over the USMC planning theory and process. First, JP 5-0 treats design as a distinct activity from detailed operational planning where as the MCPP attempts to incorporate design as an additional step to the traditional planning process. JP 5-0 is much clearer on what is required during design, offers different tools to assist the commander and the staff, and clearly delineates how detailed operational planning builds upon the operational design and approach. The MCPP is very vague, only encouraging a discussion on the environment and conceptual solution, never requiring models or offering tools to assist during design. Finally, while both JP 5-0 and MCPP are both commander centric, JP 5-0 is explicit that “operational design requires the commander to encourage discourse and leverage dialogue and collaboration to identify and solve complex, ill-defined problems” (JP 5-0, 2011). JP 5-0 clearly defines the need for a group approach led by the commander where as USMC planning theory almost discounts staff input during conceptual planning.

C. FIELD MANUAL 5-0 *THE OPERATIONS PROCESS*

FM 5-0 “constitutes the Army’s view on planning, preparing, executing and assessing operations” (FM 5-0, 2011). In one manual, the U.S. Army describes its operations process as consisting of plan, prepare, execute, and assess with planning as a sub-element to that process. FM 5-0 describes planning “as the art and science of understanding a situation, envisioning a desired future, and laying out effective ways of bringing that future about” (FM 5-0, 2011). FM 5-0 continues to explain the need for design and the military decision making process (MDMP) during conceptual planning to

understand the environment, frame the problem, define an end state and develop an operation approach. Detailed planning through continued application of the MDMP then translates the operational approach into a fully developed operational plan (FM 5-0, 2011). The quote below from FM 5-0 summarizes the interaction between design and detailed planning.

Planning consists of two separate, but closely related components: a conceptual component and a detailed component. The conceptual component is represented by the cognitive application of design. The detailed component translates broad concepts into a complete and practical plan. (FM 5-0, 2011)

The design methodology from FM 5-0 is presented in Figure 15.

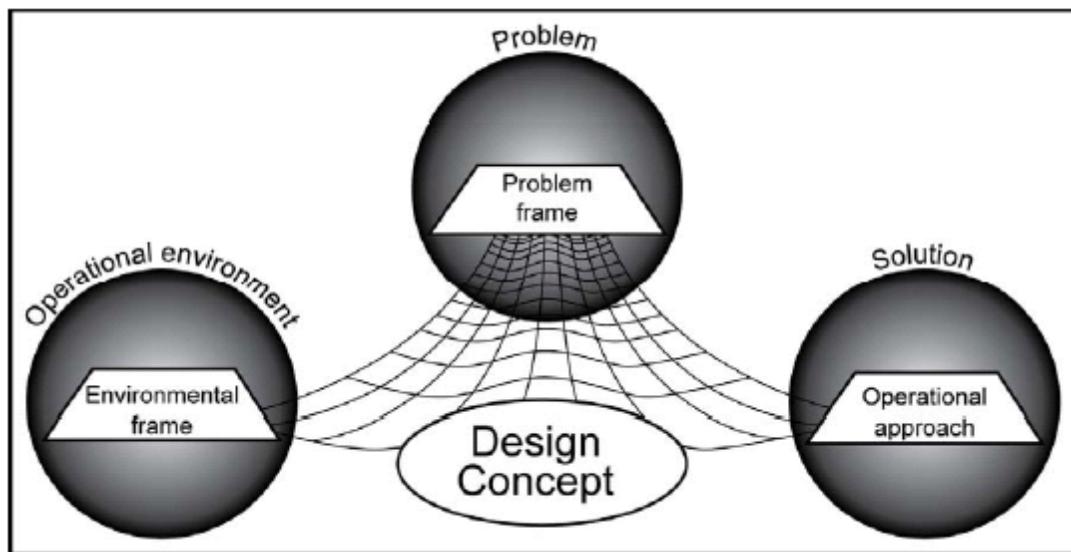


Figure 15. The design methodology (From FM 5-0, 2011)

This methodology is very similar to the elements of the operational design presented in JP 5-0, including a in depth study of the environment, problem and solution. The only difference is JP 5-0 incorporates understanding strategic direction as a distinct element where as FM 5-0 includes strategic direction and endstate under the Environmental frame. FM 5-0, like JP 5-0, also includes the design concept as an input into the MDMP especially for ill-structure problems (FM 5-0, 2011). Overall, JP 5-0 and FM 5-0 both incorporate design as a separate planning activity used primarily to

conceptually understand a problem and a solution. This conceptual understanding is captured as either a operational design in JP 5-0 or design concept in FM 5-0 and used as the primary input into the standard decision making process. There are very few substantial differences between the design concepts in JP 5-0 and FM 5-0.

D. CONCLUSION

JP 5-0 and FM 5-0 have developed a general framework that attempts to institutionalize creative imagination by incorporating design into their respective planning processes. Both doctrines functionally articulate design as a planning activity that:

- Provides input to the more analytical classical decision making process
- Uses a systems approach to analyze ill-structured situations
- Is guided by a purpose, namely strategic guidance
- Builds mental models to ensure common understanding with strategic and tactical leadership
- Involves a process of certification from strategic leadership during all phases of planning

The doctrine described in JP 5-0 and FM 5-0 is superior to the MCPP, which includes design within the traditional military planning process. However, the JP 5-0 and FM 5-0 both have limitations. Neither doctrine fully prescribes a process model for design. Both JP 5-0 and FM 5-0 prescribe possible tools and characteristics of a good design, but no doctrine actually presents a detailed methodology with a sound theoretical backing. In other words, both doctrines make progress toward the goal set out in General Mattis' *Vision for a Joint Approach to Operational Design* by establishing a general framework but lack specific processes and models that guide design execution. In response, chapter V presents an alternate planning model that builds upon the general framework presented in JP 5-0 and FM 5-0 but offers a more detailed process and methodology built upon the

architect, builder and customer model. This model, although not complete, provides the starting point for research and experimentation for the next stage of design development, moving design from a general framework to a solid process model guiding all commander and staff planning functions.

V. ALTERNATE PLANNING PROCESS

A. INTRODUCTION

The purpose of Chapter V is to present an alternative planning process based upon the architect, builder and customer model and the foundation of systems architecting: a systems approach, a purpose orientation, a modeling methodology, ultraquality implementation, certification and insights and heuristics (Maier & Rechtin, 2002). The alternative planning process attempts to translate strategic guidance into an actionable operational plan by combining two distinct activities; operational architecting and operational planning. Figure 16 provides a general model of the proposed alternative planning process.

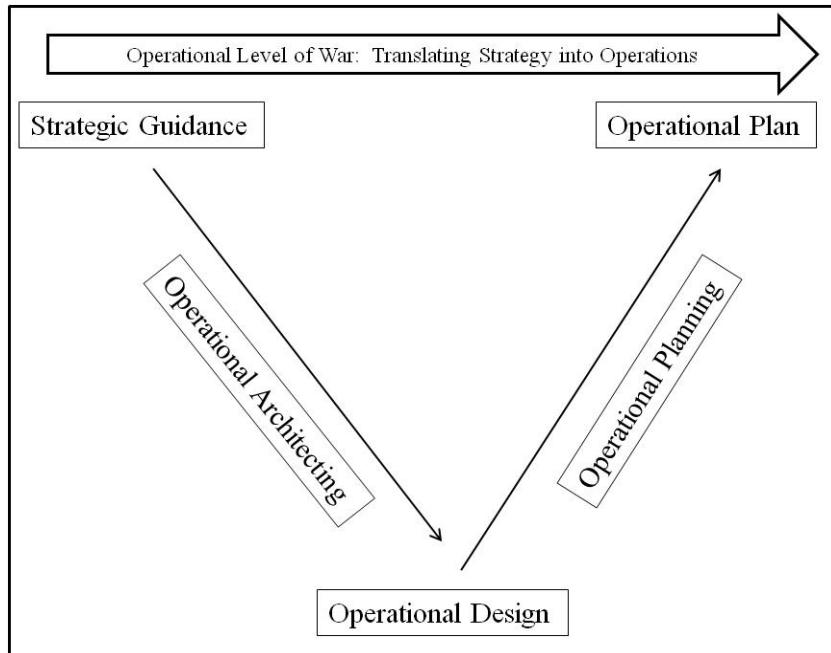


Figure 16. Overview of Alternative Planning Process
(After ACQuipedia, 2011)

The model for the alternative planning process is loosely based on the contemporary Department of Defense Systems Engineering Process model (ACQuipedia, 2011). The input into the process is strategic guidance. The first activity, operational architecting, attempts to distill strategic guidance into an operational design. As presented in

Chapter I, this thesis uses the term “operational architecting” in lieu of the term “design” and Chapter II presented the theoretical underpinnings for the replacement of terms. Those theoretical underpinnings were built upon the foundations of systems architecting and the architect, builder customer model. Chapter II concluded by describing operational architecting as the process that encompasses all operational art activities used to create the operational design which represents the environment, situation and concept of solution from a systems perspective. The bulk of Chapter V presents a detailed operational architecting process that translates strategic guidance into an operational design. Operational planning, the other activity, then builds upon the operational design and creates a comprehensive operational plan that directs tactical action to achieve the desired strategic end state. Figure 17 presents a detailed alternative planning process model.

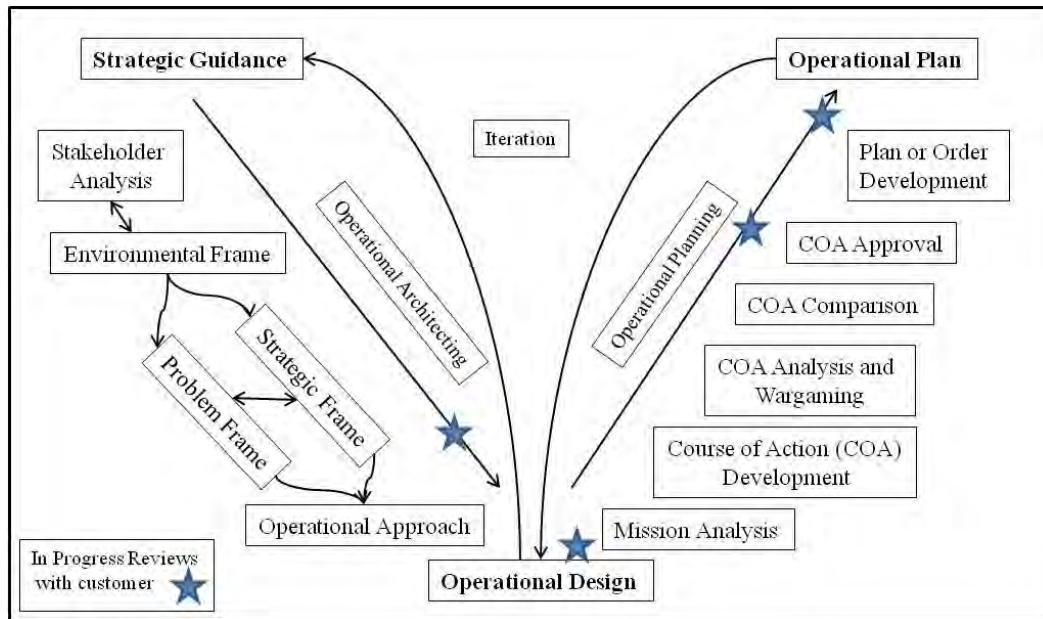


Figure 17. Alternative Planning Process
 (After Langford, 2006; JP 5-0 2011; F-M, 2011)

The following sections discuss Figure 17 in detail.

B. OPERATIONAL ARCHITECTING

Operational architecting, as defined in Chapter II, encompasses all operational art activities used to create the operational design that represents the environment, situation and concept of solution from a systems perspective. The operational design then becomes the starting point for operational planning because it is “the framework that underpins a campaign or major operation plan” (JP 1-02, 2010). The alternative planning process lays out five distinct activities within operational architecting: stakeholder analysis, environmental frame, strategic frame, problem frame and operational approach. These results of these five activities collectively become the operational design.

Operational architecting is built upon the foundation that warfare is essentially a social open collaborative system (Maier & Rechtin, 2002). Warfare is social because the primary elements are individuals and their organizations. Warfare is an open collaborative system because no one stakeholder has total “coercive power to run the system” (Maier & Rechtin, 2002). In warfare and international affairs, a successful outcome requires sub-social elements in the system to cooperate voluntarily or through force with the established American strategic purpose. Neither national nor military leaders exercise total control but ultimately depend on cooperation from other stakeholders for successful achievement of American strategic policy. Since success depends on the collaboration of other individuals and organizations, the first step in operational architecting is stakeholder analysis.

1. Stakeholder Analysis

The receipt of strategic guidance initiates the stakeholder analysis activity. Stakeholder Analysis strives to identify, classify and understand the worldview of all stakeholders possibly involved in the operational system at the present time and in the future (Checkland & Poulter, 2006). In order to facilitate the most objective perceptions, initial stakeholder analysis is performed before formal system definition or strategic guidance modeling. Although conducted first, this activity is constantly updated and refined throughout operational architecting.

The first goal of stakeholder analysis is identification and classification. This straightforward activity simply lists all possible stakeholders involved in the operational system. The list should include everyone either directly or indirectly involved in the operational system. Examples include American public, national press, strategic leadership, military leadership, adversary leadership, local populace, international partners, international competitors etc. Once stakeholders are identified, they should be classified according to the architect, builder and customer model. This model offers a rich metaphor into stakeholder roles and interactions. Usually, the military command receiving strategic direction acts as both the architect and builder. Strategic leadership usually plays the role of the customer. The American public can be considered either investors or board leadership to which the customer is responsible. The user of the architecture could possibly be defined as the local populace contained in the operational system. International competitors could be classified as competing organizations for attention of the end user. The metaphor is endless and very valuable to understand roles in a social collaborative system.

The next step is to understand the worldview of all stakeholders in the operational system. The four whos of the current operational system, “who benefits? who pays? who provides? and, as appropriate, who loses?” Maier & Rechtin (2002) provide an excellent lens for understanding stakeholder worldviews. This activity also assists in further refining role definition within the system. The four whos should also be reexamined in light of the completed operational approach. Understanding stakeholder reactions to the insertion of American national power in the operational system is a key component to minimizing unintended consequences. The ultimate goal of stakeholder analysis is an initial objective understanding of the individuals and organizations within the possible operational system. This initial analysis should be as neutral and nonjudgmental as possible. Viewing stakeholders through ill-conceived biases will eventually hinder a thoughtful and appropriate operational approach and design.

2. Environmental Frame

After the first attempt at stakeholder analysis, the next step seeks to understand and frame the operational environment. The thesis uses framing “to indicate the process of identifying the relevant aspects of the environment and distinguishing them from aspects that are not relevant to the operations at hand” (JWFC, 2010). Establishing the environmental frame is the first step of “formulating the mess” (Gharajedaghi, 2006). Jamshid Gharajedaghi in *Systems Thinking, Managing Chaos and Complexity: A platform for designing business architecture* states:

Mess is a system of problems. It is the future implicit in the present behavior of the system, the consequence of the system’s current state of affairs. The essence of the mess is the systemic nature of the situation; it is not an aggregate representing the sum of the parts. The elements of a mess are highly interrelated. No part can be touched without touching the other parts. As such, it is an emergent phenomenon produced by the interactions among the parts. Formulation of the mess, therefore, requires understanding the essence of the behavioral characteristics of social phenomena. (Gharajedaghi, 2006)

It is important to understand the mess of the operational environment constitutes the social open collaborative system described earlier in Chapter V. The mess is primarily composed of individuals and/or organizations socially interacting with no one stakeholder able to dominate the entire system. The system exists in every operational setting even before the insertion of American national power. The use of American power through the operational approach will require reframing at some point because it will fundamentally change the environment. Gharajedaghi proposes a “three-phase process of: searching, mapping, and telling the story” (Gharajedaghi, 2006).

“Searching is the iterative examination that generates, information, knowledge, and understanding about the system and its environment” (Gharajedaghi, 2006). In the operational architecting sense, searching involves system definition, stakeholder placement and interaction analysis. The goal of the searching phase is:

- The social open collaborative system defined

- A refined stakeholder list with each stakeholder mapped in or out of the defined system
- A listing of potential driving interactions by stakeholders in and out of the defined system
- A listing of other major nonsocial system sub-elements (examples are natural resources, physical features, history etc.).

Mapping is the first attempt at modeling the operational environment. This step will result in a series of different models that collectively make up the operational environment. This thesis does not present a specific format for environmental models because of the complexity and uniqueness of each operating area. The operational architecting team needs to use a format that is most suited to the particular situation. However, an area of further research would be a series of models based on different historical situations that might aid an operational architecting team as a starting point. Finally, once the modeling is complete, the operational architects need to tell the operational environment story (Gharajedaghi, 2006). This an effort to reduce the environmental models into a story that is communicable and understandable to those outside the architecting team. This will form the foundation for communications to national leadership, subordinate organizations and partners. The story needs to be as complete and simple as the operational environment allows. The results of the environmental frame are:

- Refined stakeholder list and purpose
- Series of operational environment models
- An operational environment story.

It is very important to note, that the environmental frame must be conducted objectively as possible. To some stakeholders in the system, a problem will not exist. Framing the operational environment from a neutral perspective is the key to accuracy. If the environment is framed in light of strategic guidance or even an American lens, key elements of the system may be missed. The operational environment also must not be

analyzed with either a solution in mind or possible constraints. “Finally, the mess is not defined in terms of 1) deviations from a norm, 2) lack of resources (time, money, and information), or 3) an improper application of a known solution” (Gharajedaghi, 2006).

3. Strategic Frame and Problem Frame

Once the environmental frame is established, the strategic frame and problem frame will be constructed iteratively. The environmental frame presents the current system where as the strategic frame and problem frame present the desired system and the delta between reality and strategic endstate. This activity is tackled through a series of steps modeled after elements described in Gary Langford’s paper *Reducing Risk of New Business Start-ups Using Rapid Systems Engineering* (Langford, 2006). The eighteen steps are listed below.

1. Model the desired strategic end state as defined by strategic guidance. This includes all conditions and requirements articulated in the strategic guidance.
2. Identify the strategic value of the desired strategic end state. Answer why achieving this end state is important to American strategic interests.
3. Identify all assumptions used in conducting steps one and two.
4. Refine the stakeholder analysis particularly the four whos in light of the desired strategic end state. Also, list any assumptions used for this analysis.
5. Identify obstacles between the existing operational environmental and the desired strategic end state.
6. Model those obstacles within the operational environment frame.
7. Identify stakeholders that create or interact with those obstacles. Refine the stakeholder analysis for those individuals and/or organizations identified. List any assumptions used in this analysis.

8. Map any constraints detailed or implied in the strategic guidance on the operational environment.
9. Use the obstacles, constraints and associated stakeholders to model the initial problem.
10. Overlay problem frame and strategic frame onto the environmental frame.
11. Attempt to tell the problem story.
12. Redefine if possible the strategic end state based solely on desired strategic value. If possible, model another end state that achieves the desired strategic value.
13. Repeat steps 1 through 11 using the alternative strategic end state.
14. Compare the problem frames and associated strategic end states, constraints and assumptions.
15. Decide on a problem and strategic frame.
16. Refine the problem story
17. Define the strategic value of solving the refined problem and achieving the desired end state. Compare those results to the strategic value if the problem remains unsolved.
18. Repeat steps 15 to 17 until the operational architecting team understands the problem and strategic frame and the value added if the problem is solved.

Steps one through eighteen can be repeated until the operational architecting team and particularly the commander are satisfied with the results and ready to proceed to the operational approach. It is very possible that this process yields an alternative strategic end state. If so, it will require engagement with national strategic leadership to clarify the true nature of the strategic guidance and come to a common understanding before identifying the operational approach.

4. Operational Approach

The last step in operational architecting is establishing the operational approach. “The operational approach is a description of the broad actions that will create the conditions that define the desired system” (USJFCOM, 2010). The operational approach is a true application of operational art to the operational environment and problem to achieve the strategic end state. This process is the most familiar to military professionals and this approach should be formulated using the operational architecting team’s experience, training and judgment. For operational architects, heuristics and insights from historical examples and experiences will form the basic tool kit. The operational architect should continually add heuristics through discovery and experimentation during a career in the military profession, but an important element is not to simply focus on experiences or historical examples. There is a danger of relying too heavily on tools already in the tool kit (Gharajedaghi, 2006). Successful operational architecting will require the creation of new tools and methods vice simply relying on the past (Gharajedaghi, 2006). Once the operational approach is crafted, a model must be constructed for communication. It is also useful to reevaluate all other elements of the operational design in light of the agreed upon operational approach.

The outcome of operational architecting is the operational design. The final design consists of:

- Stakeholder Analysis
- Environmental Frame
- Strategic Frame
- Problem Frame
- Operational Approach.

C. OPERATIONAL PLANNING

1. Joint Operational Planning Process

Once the operational design is complete and certified by strategic leadership, it becomes the basis for the beginning of the JOPP. The JOPP is a well-defined process that translates the operational requirements embedded in the operational design into an actionable plan and is presented in Figure 13.

2. Links between Architecting and Planning

The only proposed additions to the JOPP are architecture/planning reviews after each planning step. These reviews compare work completed in a certain planning step to the operational design. There are two purposes for these formal reviews:

- To ensure operational planning corresponds to the approved operational design
- To continually validate the operational design for accuracy and relevance.

D. CERTIFICATION AND ITERATION

Certification and iteration are key components of the alternative planning process. Certification is the process where as strategic leadership (customer) continually approves the alternative planning process outputs leading up to the operational plan. The in progress reviews (IPR) would be much like those depicted in Figure 11. The process expects to have two IPRs during the operational architecting activity that:

- Discusses and approves the stakeholder analysis, environmental frame, strategic frame and problem frame;
- Discusses and approves the operational design which includes the operational approach and refined products from first IPR.

There would also be two IRPs during the operational planning activity that:

- Discusses and approves selected COA as well as reviews refined operational design as applicable;

- Discusses and approves final operational plan.

Finally, iteration of the process would occur for two distinct cases. One reason for iteration would be dissatisfaction with the results from the commander and/or strategic leadership. Another cause for iteration would be a major change within or without the system, which renders the original work in its current form as invalid.

E. CONCLUSIONS

Chapter V has presented an alternative planning process different from that which is currently espoused in U.S. joint and service doctrine. The planning process proposed maps out operational architecting and operational planning as two separate activities that together translate strategic guidance into an operational plan. The activity of operational architecting is a further refinement of the design concept introduced in Chapter I and described in General James N. Mattis' *Vision for a Joint Approach to Operational Design*. Operational architecting is built upon the foundations of systems architecting as described in Chapter II: a systems approach, a purpose orientation, a modeling methodology, ultraquality implementation, certification and insights and heuristics (Maier & Rechtin, 2002). The operational design is the outcome of the operational architecting activity and forms the foundation for all operational planning. The alternative planning process utilizes the standard JOPP, only adding formal reviews that compare work produced during the JOPP to the operational design for consistency and design revalidation. The strength of the alternative planning process is that it:

- Offers more rigorous procedures for building an operational design
- Elevates operational architecting to the level of operational planning and seamlessly integrates the two activities.

These key features produce a planning process that is more robust and more focused on the strategic purpose and solving the right problem.

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VI. CONCLUSIONS

A. RECOMMENDATIONS

Overall, the purpose of this thesis has been to develop a framework for a USMC planning model. In order to work toward that end, this thesis has:

- Introduced operational design as described by U.S. joint doctrine in Chapter I
- Explained the operational level of war as an application of systems theory to warfare in Chapter II
- Presented a guiding theory for the construction of an operational design process based upon the foundations of systems architecting in Chapter II
- Evaluated the effectiveness of operational design processes and activities as described in USMC, U.S. Army and joint planning doctrine in Chapters III and IV
- Presented an alternative planning process in Chapter V.

Currently, the MCPP is woefully deficient in its integration of operational design into its doctrine and activities. U.S. Army and joint doctrine provide a better foundation but fail to articulate specific activities required for the construction of an operational design and fail to map out a seamless transition between design and planning. The alternative planning process presented in Chapter V redefines operational design as operational architecting and builds a process based upon the foundations of systems architecting and the architect, builder customer model. This process presents discreet and tangible activities that act as a guide for the construction of an operational design. This design then becomes the basis for the more familiar JOPP and the production of the operational plan. The alternative planning process as presented attempts to separate operational architecting and operation planning into two distinct activities but provide for a seamless

transition. The process also utilizes a systems approach to translate strategic guidance (the purpose for military operations) into an actionable operational plan that directs tactical actions.

The thesis recommends that the USMC adopts the alternative planning process as a baseline attempt to expand the role of operational design in Marine Corps Planning Theory. Once the Marine Air Ground Task Force (MAGTF) Staff Training Program refines the process, the USMC should begin to experiment with the alternative planning process during student exercises at Marine Corps University and during Marine Expeditionary Forces (MEF) staff training events. The outcome from these experiments should be a more robust planning theory and process that accommodates all activities required to effectively plan military operations that truly accomplishes the strategic guidance of national leaders.

B. AREAS FOR FURTHER RESEARCH

This thesis revealed three major areas for research in the view of the author. First, more research needs to be conducted into the specifics of conducting operational design. The literature reviewed during this thesis offer very compelling definitions but very few details on its actual conduct. The thesis attempted to begin that conversation by presenting the alternative planning process, however more research is definitely required. This research should be supported by not only experimentation but also historical studies aimed at understanding how successful military operations translated strategic guidance into operational plans. Secondly, research should focus on the makeup of organizations that best support operational architecting and planning. None of the literature reviewed even approached the subject of effective military staff organization for operational design and planning. There has been no research into changing the current military staff organization in order to manage operational planning. Finally, research needs to be conducted on how to train planning staffs. It is useless to adopt new doctrine but not equip military professionals with the tools and training required to implement new techniques and processes. Without training, military professionals will rely on habit patterns and experience especially in time-sensitive situations.

Planning is key to ensuring American military power promotes national policy and achieves strategic objectives. Operational design is a key component of clearly translating guidance into actionable military plans. Without a robust planning process that includes design and the ability to understand complex, ill structured situations and responses, the American military will continually achieve less than optimal results. An updated thorough planning process and trained organizations that can implement that process is a small investment that can possibly avoid costly mistakes with American blood and treasure.

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